Complete Statement of G. Edward Dickey, Ph.D.
on
Reducing Hurricane and Flood Risk to the Nation
before
Subcommittee on Water Resources and Environment
Committee on Transportation and Infrastructure
U. S. House of Representatives
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Thank you, Mr. Chairman, for inviting me to testify on the important topic of reducing hurricane and flood risk to the Nation. I am pleased to have this opportunity to draw upon my years of experience with Federal water resources management and provide advice on how Congress can best continue to reduce the hurricane and flood risk to lives and property through the Army's Civil Works Program.

OVERVIEW

From the very beginning of the program, Civil Works projects have been developed based on situation-specific studies resulting in recommendations tailored to particular circumstances. These studies incorporate hydrologic, engineering, economic and, for several decades now, ecological, cultural and other environmental knowledge and analyses. The Corps feasibility study process has served the Nation well and has provided us with extensive infrastructure that is essential to the effective functioning of our economic system and continuing economic growth. However, it has not been perfect.

Not all projects have performed as predicted or have been as productive as anticipated. Structural or operational modifications have been required to accommodate changing economic conditions, new scientific knowledge, technological change and changing public values. Insufficient attention was paid historically to the interactions between engineering structures, which extensively modified hydrologic regimes, and the physical and biological environment. Equally important, insufficient attention continues to be paid to the impact of hazard reduction on human behavior.

LESSONS FROM SOUTHERN LOUISIANA

These short-comings have been amply demonstrated in Southern Louisiana. Extensive engineering works for managing the Mississippi River and numerous large-scale coastal navigation and storm damage reduction projects have caused widespread and on-going changes in physical landscapes and ecosystems. These changes were not foreseen or, if anticipated, were considered to be a necessary consequence of economic advancement. In addition, these works allowed new patterns of economic activity and changed where and how people live and work. The historic focus of storm and flood damage project development was on reduction of inundation damages to property. Clearly, as in the case of New Orleans, insufficient attention was paid to residual risk and to the vulnerability of the occupants of protected areas when the provided project protection proved inadequate. The potential for disruption of human activity within protected areas and the economic consequences to the rest of the nation were not addressed in any detail. The devastation wrought by Hurricane Katrina is a compelling demonstration of the reality of residual risk and the necessity to include its management in water resources planning and project implementation.

THE VALUE OF CIVIL WORKS PLANNING

The Civil Works Program has always been at the forefront of situation-specific planning. The major outputs of water projects--flood and storm damage reduction, navigation and water supply--lend themselves to benefit estimates in monetary terms. Most project costs can be quantified in monetary terms, as well. Comparisons on benefits and costs of specific project possibilities are readily made. Moreover, each planning situation is unique in terms of the issues to be addressed and the opportunities to address them. There are no cookie cutter, one size fits all, environmentally sensitive solutions to flood and storm threats or any other mix of water related issues. Congress has long recognized that fact and has generally required a Corps of Engineers report to be submitted for its consideration before it takes action to authorize and fund a project. This approach to public investment decision-making allows government to function at its best–making informed choices among competing values as identified in a feasibility study.

Situation-specific feasibility studies are important from several perspectives. Not enough resources are available to produce all the goods and services we value. This is true at all decision levels, public and private. As individuals we must make tough choices about how to use our incomes. Businesses cannot do all that they might want to do in order to increase their profits. Federal, state and local governments not only face conflicts among competing values such as economic growth and environmental and social preservation in virtually every resource management situation, they also confront the fact that there are more demands for their respective budgetary resources than they can satisfy. As Congress wraps up the FY 2006 appropriations process, choices must be made, and many compelling justifications are being advanced for allocating available program funds in one direction or another. The reality is that many problems must remain unaddressed or incompletely solved, and many opportunities left to the future. It behooves us, therefore, to make the best use of what we have. Scarcity of resources is a fundamental condition of human existence. Scarcity must be addressed in individual project planning and at the program level where the competing budgetary demands of meritorious projects across the Nation must be balanced in the most responsible way possible.

The Corps planning process as it relates to individual project decisions

Analysis plays an essential role in decision-making throughout the water resource planning process. The Corps of Engineers is required to go well beyond the calculation of a benefit/cost ratio for a recommended project. Incremental analysis as required by the U. S. Water Resources Council's Principles and Guidelines[*] is at the heart of the Corps' plan formulation process. Projects of different scales and scopes are systematically considered so that trade-offs among alternative mixes of project purposes and alternative solutions can be identified, and the relative merits of different plans for resource use can be systematically evaluated in light of prevailing economic, environmental and social values.

The Corps of Engineers' application of the Principles and Guidelines has grown with its missions and with the comprehensiveness of its studies. The Corps has been a pioneer in applying its techniques of incremental analysis to develop ecological restoration plans and multiple purpose plans providing a mix of economic and ecological outputs. In situations where benefits are not monetized, as in the case of ecological restoration, costs of successive increments of output are identified with the goal of weeding out unproductive project features where the expenditure of resources does not produce commensurate benefits. (Where benefits are not monetized, the study is referred to as a cost-effectiveness analysis, but the analytical process is similar to that for a benefit/cost study.) In short,

[*] Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, March 10, 1983

tradeoff analysis is essential to informed choice among competing alternative plans regardless of the nature of the alternative plans' outputs. Such analyses support both the Comprehensive Everglades Restoration Project and the Louisiana Coastal Areas Program.

Sometimes significant aspects of a comprehensive plan are not captured in a cost-benefit or cost-effectiveness analysis. Regional impacts and social impacts not contained in the plan's economic analyses can be significant in decision-making. An appropriately constructed display of tradeoffs provides a framework for consideration of these impacts. Congress and a project's non-Federal sponsor should be able to understand the "price," in terms of both benefits foregone and additional costs incurred, of accommodating these kinds of concerns. Again the Corps' analytic framework assists informed decision-making by both the Federal Government and the projects' sponsor regardless of the complexity of the issues and the possible tradeoffs among competing values.

Programmatic benefits of Corps project planning

Sound situation-specific feasibility studies are essential from the programmatic perspective as well. Well-crafted situation-specific planning helps ensure that the Civil Works Program is as productive as possible. State and local governments, in their role of project sponsors, clearly influence Federal spending priorities by their willingness to contribute their funds to project implementation. However, the effective limit on the size of the Civil Works Program is Federal funding. As we all know, Federal funding has been increasingly difficult to get for the past decade, and Federal appropriations have not kept pace with the willingness of non-Federal project sponsors to contribute their funding shares. Because of the constraints on the total Civil Works Program imposed by Federal funding limitations, expending funds on projects which contain unproductive elements, like project funding that is not leveraged by non-Federal contributions, imposes a major cost to the Nation in terms of the benefits-forgone. Construction of other productive Civil Works projects is delayed or eliminated. Tradeoffs among projects are real at the programmatic as well as at the project level.

The scarcity of Federal appropriations is not presently reflected in individual Corps feasibility studies, but the limited availability of Federal funds certainly should be an essential consideration as project proponents select their preferred damage mitigation strategies.

CLIMATE CHANGE AND ITS EFFECTS

Recent scientific evidence has made water resource planning even more challenging. Global warming and its impacts including sea level rise and changing weather and storm patterns will make traditional Corps feasibility studies more complex. Consideration of sea level rise brings an added consideration to many types of planning studies, not just Corps studies, in coastal areas. Estimates of benefits and costs may change, and project designs may be influenced substantially as a result of climate change and its impacts. As scientific information continues to be developed, the effects of climate change should be incorporated into feasibility studies.

NEW POLICY DIRECTIONS

Some have argued that the hurricane and flood threat to major population centers demand simplified approaches to Federal water project investment decisions. I believe that the Corps' traditional planning approach offers the best hope for making wise responses to the evolving hurricane and flood threats we face across our vast Nation. The powerful conflicts among values are unique in each planning situation and can not be successfully addressed at the programmatic level.

Four programmatic policy changes that would improve Corps feasibility studies and project implementation warrant the attention of Congress. They are briefly summarized below. The first three pertain directly to how the Corps plans. The fourth addresses a larger policy issue.

First, Corps planning should be focused on managing the total flood risk rather than on developing a Federal project to manage a portion of the risk. There will always be a flood risk remaining after any plan is implemented. Both the Congress and the non-Federal sponsor should be given a plan for managing the total risk. Congress should ensure that every plan that it authorizes is complete in that structural measures are accompanied by appropriate local regulatory and other management measures such as maintenance of evacuation plans as necessary adjuncts to structural investments. This is not a new idea (See, for example, Section 202(c) of WRDA '96); it has been resisted for years.

Second, the Corps needs to do a better job of identifying and quantifying the benefits of its projects. We can now fully appreciate that large scale, albeit infrequent, events like Hurricane Katrina have economic and social costs that extend beyond the standard project benefit calculations based on reductions in property damages that are typically contained in Corps reports. Expansion of benefit calculations will require development and use of new techniques and expertise and will require added resources for individual studies and for research that can support the uses of broader benefit calculations.

Third, the impacts of new water resource infrastructure on the location of human activity should be explicitly addressed in the planning process. Since the 1960s, interactions between Federal projects and ecological systems has been increasingly recognized and addressed in resource investment and management planning. Project-induced impacts on human activity continue to be largely ignored in Corps feasibility studies. Congress should require that the Corps and its non-Federal sponsor evaluate changes in the location of human activity and private investment that are likely to be induced by a damage mitigation project. Management actions such as zoning and building codes that minimize undesirable impacts should be required of the sponsor as an integral part of the plan's implementation.

Fourth, National Flood Insurance Program policy should be altered. Civil Works planning takes place in a larger Federal policy framework. Properties located outside the "100-year floodplain" are not subject to the requirements of the National Flood Insurance Program. Communities sometimes see the objective of a Civil Works storm or flood damage reduction feasibility study to be to find the cheapest way to remove the community from the requirements of the Federally mandated flood insurance program rather than how to provide the best flood damage reduction plan for its inhabitants. Such thinking distorts project decision-making and shifts attention away from the issue of residual risk. Congress should require properties which benefit from a Federal storm or flood damage reduction project to maintain policies that would insure them against residual flooding risk. This requirement would promote better plan selection decisions and better use of the lands afforded a degree of flood protection by a project.

SUMMARY

Congress should continue to rely on situation-specific water resource studies when deciding to authorize and fund measures to reduce the evolving hurricane and flood threat. Sound water resource planning considers the economic, environmental and social conditions of a particular place and allows the inevitable tradeoffs among competing values to be addressed in an informed way. Sound planning also helps ensure that Congress will make the best use of available Federal funds as it allocates resources across competing projects nationwide. More comprehensive analyses, the management of residual risk through flood insurance requirements and other actions by project sponsors that complement a Federal investment can further improve our Nation's ability to protect floodplain residents from hurricane and flood threats.